

WHAT IS CLAIMED IS:

1. A method of storing failed packet data units (PDUs) in a packet-transmission system, in which the PDUs are encoded to include redundancy, and punctured according to a specified puncturing scheme prior to transmission, the method comprising:
  - receiving a transmission;
  - processing the received transmission to retrieve a PDU;
  - de-puncturing the PDU;
  - decoding the de-punctured PDU; and
  - if the decoded PDU contains errors, then storing the PDU and requesting retransmission.
2. The method of claim 1, wherein the step of storing the PDU comprises:
  - compressing the PDU; and
  - storing the compressed PDU.
3. The method of claim 2, wherein the PDU is transmitted over a plurality of different transmission bursts.
4. The method of claim 2, wherein the step of processing the received transmission comprises:
  - generating a sequence of soft-values representative of each bit in the received transmission;
  - calculating and storing a scale factor representative of the soft-values within the sequence; and
  - generating a sub-sequence of soft-values representative of a transmitted PDU.
5. The method of claim 4, wherein the scale factor is an average of the absolute values of the soft-values within the sequence.

6. The method of claim 4, wherein the step of compressing the PDU comprises:
  - storing the sign of each soft-value within the sub-sequence.
7. The method of claim 2, wherein the PDU is compressed in its punctured format.
8. The method of claim 7, further comprising:
  - determining, prior to decoding the de-punctured PDU, if there are any compressed PDUs stored in memory that correspond to the currently received, de-punctured PDU;
  - if there are any corresponding PDUs stored in memory then, for each corresponding PDU:
    - decompressing the PDU;
    - de-puncturing the decompressed PDU;
    - combining the de-punctured, decompressed PDU with the currently received, de-punctured PDU;
    - decoding the combined PDU; and
  - if the decoded combined PDU contains errors, then compressing and storing the currently received punctured PDU.
9. The method of claim 2, wherein the PDU is compressed in its de-punctured format.
10. The method of claim 9, further comprising:
  - determining, prior to decoding the de-punctured PDU, if there are any compressed PDUs stored in memory that correspond to the currently received, de-punctured PDU;
  - if there are any corresponding PDUs stored in memory then, for each corresponding PDU:
    - decompressing the PDU;

combining the decompressed PDU with the currently received, de-punctured PDU;

decoding the combined PDU; and

if the decoded combined PDU contains errors, then compressing and storing the currently received de-punctured PDU.

11. The method of claim 10, wherein the step of processing the received transmission comprises:

generating a sequence of soft-values representative of each bit in the received transmission;

calculating and storing a scale factor representative of the soft-values within the sequence; and

generating sub-sequence of soft-values representative of a transmitted PDU.

12. The method of claim 11, wherein the scale factor is an average of the absolute values of the soft-values within the sequence.

13. The method of claim 11 wherein the step of compressing the PDU comprises:

storing the sign of each soft-value within the sub-sequence.

14. The method of claim 13, wherein the step of decompressing the corresponding PDU comprises:

multiplying the stored sign of each soft-value in the sub-sequence by the stored scale factor.

15. A receiver comprising:

a soft output detector configured to generate a sequence of soft-values representative of each bit within a received transmission;

a decoder;

local memory; and

a processor, the processor comprising logic configured to:  
    process the retrieved transmission in order to retrieve a PDU;  
    de-puncture the PDU; and  
    compress and store in the local memory the retrieved PDU if  
the de-punctured PDU fails the decoding process.

16. The receiver of claim 15, wherein the processor further includes logic configured to:

    determine, prior to decoding the de-punctured PDU, if there are any  
corresponding compressed PDUs stored in memory;  
    for each stored PDU the logic is configured to:  
        decompress the PDU;  
        de-puncture the decompressed PDU;  
        combine the de-punctured, decompressed, PDU with the  
currently received de-punctured PDU; and  
    compress and store the retrieved PDU, if the decoded combined PDU  
fails the decoding process.

17. A computer-readable storage medium having stored therein one or  
more instructions that cause a processor to perform the steps of:  
    processing a received transmission to retrieve a PDU;  
    de-puncturing the PDU;  
    decoding the de-punctured PDU; and  
    If the decoded PDU contains errors, then compressing and storing the  
punctured PDU.

18. The computer-readable storage medium of claim 17, further  
comprising one or more instructions that cause a processor to perform the  
steps of:

    determining, prior to decoding the de-punctured PDU, if there are any  
corresponding compressed PDUs stored in memory;

if there are compressed PDUs stored in memory then, for each compressed PDU:

- decompressing the PDU;

- de-puncturing the decompressed PDU;

- combining the de-punctured, decompressed, PDU with the currently received, de-punctured PDU;

- decoding the combined PDU; and

if the decoded combined PDU contains errors, then compressing and storing the currently received punctured PDU.